

Supply Chain Management (SCM) using AutoML (PyCaret)

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Course Objective

This course provides a **hands-on approach** to applying **AutoML techniques** using **PyCaret** in **Supply Chain Management (SCM)**. By leveraging automated machine learning, businesses can enhance **demand forecasting, inventory optimization, supplier risk assessment, and logistics efficiency**.

By the end of this course, you will:

- Understand SCM fundamentals and key optimization challenges
- Learn how **AutoML using PyCaret** can improve supply chain decision-making
- Build and evaluate **predictive models** for demand forecasting and risk assessment
- Automate **ML model selection, tuning, and deployment**

Introduction to AutoML and PyCaret

Why AutoML in Supply Chain Management?

- Traditional SCM analytics vs. Machine Learning approaches
- AutoML benefits: **Automation, Speed, and Scalability**
- Overview of **PyCaret** for easy ML model implementation

Environment Setup

Ensure you have **Google Colab** or a Python 3.x environment with the following:

```
!pip install pycaret pandas numpy matplotlib seaborn
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from pycaret.regression import *
```

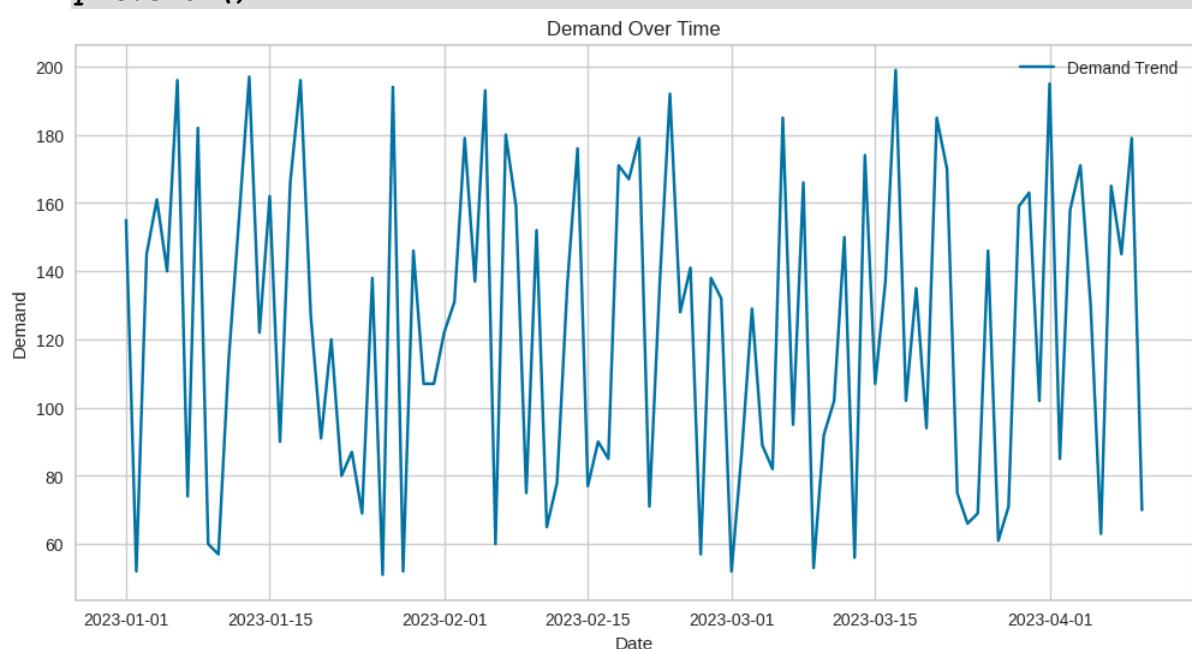
Supply Chain Data and Preprocessing

Sample Dataset: Demand Forecasting

```
data =
pd.read_csv('https://raw.githubusercontent.com/jbrownlee/Datasets/master/daily-min-temperatures.csv')
data.columns = ['Date', 'Demand']
data['Date'] = pd.to_datetime(data['Date'])
data.set_index('Date', inplace=True)
data.head()
```

Data Visualization

```
plt.figure(figsize=(10,5))
sns.lineplot(x=data.index, y=data['Demand'], color='blue')
plt.title('Daily Demand Trend')
plt.xlabel('Date')
plt.ylabel('Demand')
plt.show()
```



Building an AutoML Model

Setting Up PyCaret

```
exp = setup(data, target='Demand', session_id=123, silent=True)
```

Training & Comparing Models

```
best_model = compare_models()
```

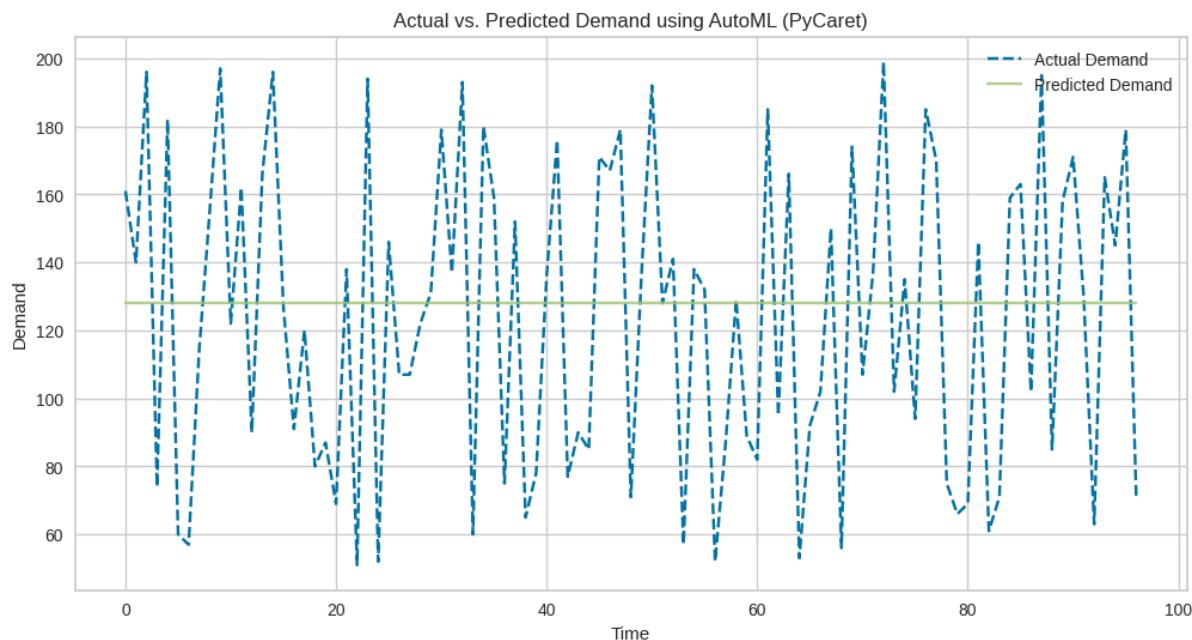
Evaluating the Best Model

```
evaluate_model(best_model)
```

Forecasting Future Demand

Predicting Future Demand with AutoML

```
predictions = predict_model(best_model, data=data)
plt.figure(figsize=(10,5))
sns.lineplot(x=data.index, y=predictions['Label'],
label='Predicted Demand', color='red')
sns.lineplot(x=data.index, y=data['Demand'], label='Actual Demand',
color='blue')
plt.title('Demand Forecasting using AutoML')
plt.legend()
plt.show()
```



Deploying the Model

Saving and Loading the Trained Model

```
save_model(best_model, 'scm_demand_forecast')
loaded_model = load_model('scm_demand_forecast')
```

Making Predictions with New Data

```
new_data = pd.DataFrame({ 'Demand': [200, 250, 300] })
predict_model.loaded_model, data=new_data)
```

Course Summary

- Applied AutoML (PyCaret) for Demand Forecasting in SCM
- Automated Model Selection, Training, and Evaluation
- Forecasted Future Demand and Optimized Inventory Planning
- Deployed and Saved Models for Real-World SCM Applications